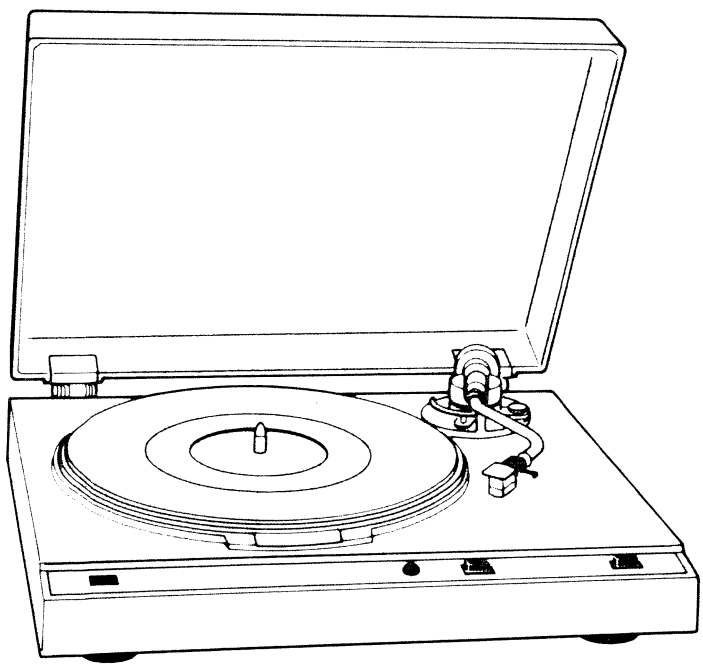
FR-D3

SERVICE MANUAL

AUTOMATIC RETURN DIRECT-DRIVE TURNTABLE

SANSUI FR-D3



Sansui

SANSUI ELECTRIC CO., LTD.

SPECIFICATIONS

Type	Two-speed direct-driven
Speeds	33-1/3, 45 rpm
Fine speed adjustment range	±3 %
Platter	Aluminum alloy die-cast 300 mm (11-13/16") diameter, 1.1 kg (2.42 lbs)
Motor	Brushless DC servo-type
Wow and flutter	Less than 0.028 % (WRMS)
S/N	Better than 60 dB (IEC-B)
Rumble	Better than 72 dB (DIN-B)
Tonearm	Statically-balanced S-shaped tubular type
Tonearm length	220 mm (8-11/16")
Overhang	17.5 mm (3/4")
Optimum cartridge wieght When the headshell supplied is employed	2 ~ 10 g
Dimensions	440 mm (17-11/32") W 130 mm (5-1/8") H 385 mm (15-5/32") D
Weight	6 kg (13.2 lbs) net 7 kg (15.4 lbs) packed
Power consumption	5 W (rated)

- The power voltage is adjusted to the one of the area where you bought the unit.

Specifications of the cartridge (applicable only to the units with cartridge)

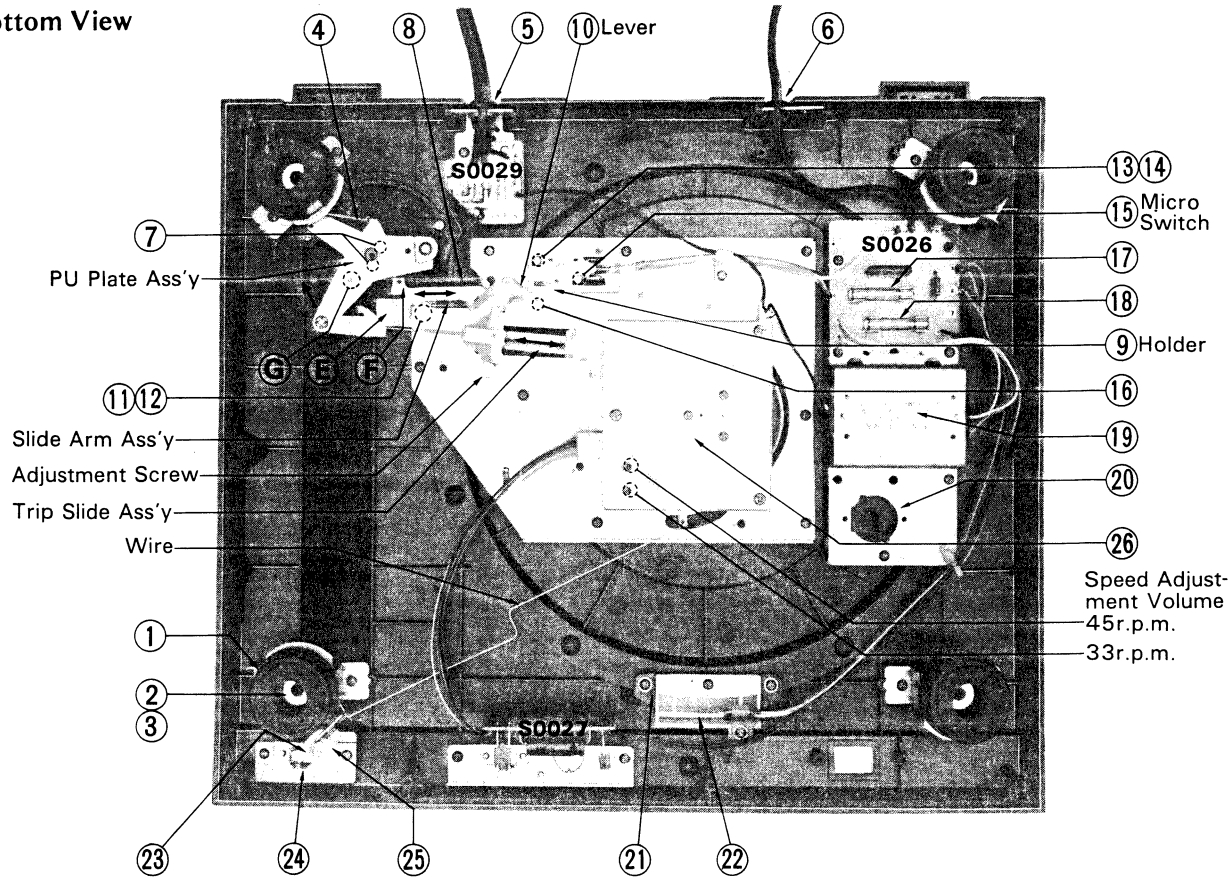
Model SC-50

Type	Induced magnet
Frequency response	10 ~ 20,000 Hz
Output voltage	3 mV per channel (1,000 Hz, 35.4 mm/sec)
Load impedance	47 kΩ
Tracking force	2.5 g
Stylus	0.6 mil, diamond spherical (SN-50)

* Design and specifications subject to change without notice for improvements.

1. PARTS LOCATION & PARTS LIST

● Bottom View



Parts List <Bottom View>

Parts No.	Stock No.	Description
1	7072110	Insulator
2	5182400	Washer, insulator
3	5109914	3 x 10 Screw, insulator
4	6903440	Spring, PU plate
5	3910570	Strain Relief, output cord <XX, CS, EU, UL>
6	3910600	Strain Relief, power cord <XX, CS, UL>
7	5162850	3 x 15 Screw, PU plate
8	6903430	Spring, slide-arm
9		Holder
10		Lever
11	5151005	E Ring, slide-arm
12	5183090	5φ Washer
13	5107847 5162840	3 x 14 Screw <XX, CS, UL, AS> 3 x 15 Screw <EU, BS>
14	5121240	3φ Spring Washer
15	1160190	Micro Switch
16	5151004	3φ E Ring, lever, holder
17	0432210	0.5A AC Fuse <XX, CS, UL>
18	0432210	0.5A AC Fuse <XX, CS, UL>
19	4003130 4003132	Power Transformer <XX> Power Transformer <CS, UL>
20	1190720 1190730	Power Supply Voltage Selector <EU, BS> Power Supply Voltage Selector <XX> (Silver MODEL)
21	5442040	Strobo Cover
22	0410130	Neon Lamp
23	6502970	Stop Lever
24	1131940	Stop Switch
25	5182290	3φ, CS Ring
26	4320710	DD Motor (Motor Control Circuit Board)

Parts List <Top View>

Parts No.	Stock No.	Description
1	5362710	Control Plate <XX, CS, UL>
2	5312421	Knob for Pitch Control
3	5322180	Push Switch Knob
4	5322180	Push Switch Knob
5	6172040	EP Adaptor
6	3800470, 1	Power Cord <XX, CS, UL>
7	3810340 3810350	Output Cord <XX, CS> Output Cord <UL>
8	6912670	Main Weight Ass'y
9	5062480	Cover, adjust screw
10	7092930 7092940	Arm Base Ass'y (Silver MODEL) Arm Base Ass'y (Black MODEL)
11	6912660	IFC Ass'y (Knob, Drum, Threading, Spring, Screw Washer)
12	6622300 6622310	Arm Rest (Fook Screw) (Black MODEL) Arm Rest (Fook Screw) (Silver MODEL)
13	7052640	Lifter Lever Ass'y (Lever, Cum, Knob)
14	7082350	Lifter Plate Ass'y (Lifter Plate, Lifter Lever Ass'y, Lifter Piston)
15	7092920	Tone Arm Ass'y
16	6642360	Head Shell Ass'y
17	4310370	Cartridge Ass'y, SC-50
18	4940230	Stylus, SN-50
19	5192160	Screw for Stylus
20	6002110	Main Gear Ass'y
21	5151006	(5φ, E Ring)
22		(Auto Clutch, lower)
23		(Auto Clutch, upper)
24	5182290	(3φ, CS Ring)
25	6322030	Steel Ball, 5φ
26	7012220	Dust Cover Ass'y
27	5502950	(Cushion)
28	6922410	Auto Hinge
29	5502960 5502970	Turntable Sheet <XX, EU, CS, BS> Turntable Sheet <UL>
30	6112230	Turn Table
31	6002100	Pinion Gear

Note: Parts without Stock No. are not supplied.

Notes

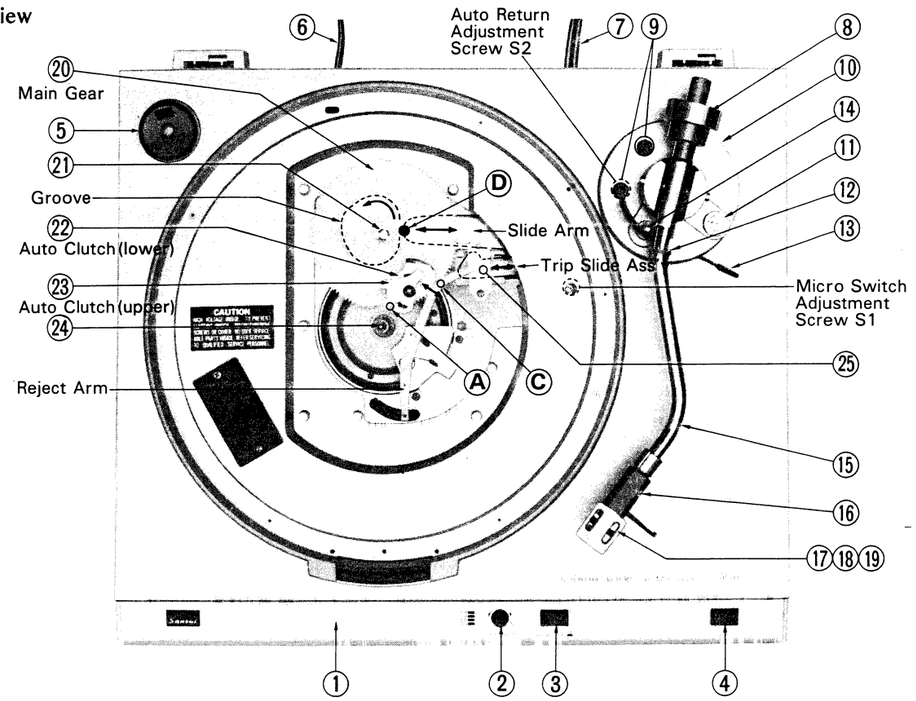
Note 1 There are two types of units in FR-D3 with cabinet color of black & silver.

Note 2 There are two types of units in FR-D3.
These units are so identified as following.
1) **The unit with a cartridge.**
The label indicating replacement stylus (SN-50) is affixed on the cabinet near the tonearm.
2) **The unit without a cartridge.**
The mark **E** is stamped on the side of carton case.
* In particular area, either type of these units is sold.

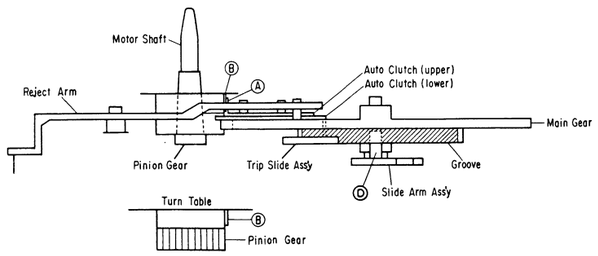
Note 3 As to U.L., C.S.A., B.S., ES, A.S. and xx marked in the Parts Lists, note the followings:
U.L., C.S.A. . . . Parts used in the unit which is applicable to the U.S. and Canada under industrial standards.
B.S. . . . . Parts used in the unit which is applicable to British under industrial standards.
E.U. . . . . Parts used in the unit which is applicable to Sweden, Denmark, Norway, Finland, West Germany, and Switzerland under industrial standards.
XX . . . . . Parts used in the unit which is applicable to other countries excepting mentioned above.

* In this parts list, parts with no above mark in the place of Description are all the same as XX marked parts.
* The unit with silver cabinet is not sold in the area, EU, and B.S.

• Top View



2. OPERATION OF AUTO RETUN SYSTEM



[1] Auto Return Operation (See Bottom & Top View and Fig. above)

1) When stylus reaches lead-out groove, trip slide ass'y linked with PU plate ass'y fixed to the tonearm shaft is pushed toward the motor auto clutch (lower) being pushed out to the place where the tooth of main gear are off.
2) As part Ⓐ of auto clutch engages with the trigger Ⓑ by the above, main gear starts rotating counterclockwise. The part Ⓐ is replaced by reject arm Ⓒ after 1/8 rotation of main gear.
3) After main gear starts rotating, slide-arm is pressed to tonearm direction since the knob on the slide-arm follows the groove notched on main gear.
4) With the motion of slide-arm, arm-lifter is arised by the part Ⓔ of slide-arm and part Ⓖ of PU plate is also pushed outward by the part Ⓕ of slide-arm, which causes tonearm linked with PU plate rotating counterclockwise to return. At returning of tone-arm trip slide ass'y linked with tonearm moves lever holder to cut the micro switch to turn off the power.

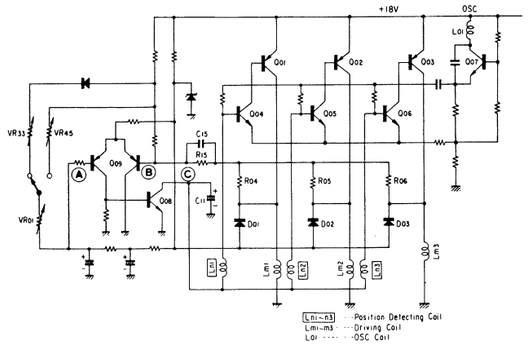
[2] Auto Stop Operation

1) If stop button is pushed during record playing, tonearm returns automatically to the arm rest.
2) When stop button is pushed, reject arm is pulled by the wire joined with stop button.
   By this, part Ⓐ of auto clutch (upper) on the main gear is placed at the part the tooth of main gear are off. The following operation is the same as auto return operation.

3. OPERATION OF MOTOR CONTROL CIRCUIT

[1] Start-Up and Driving of Motor

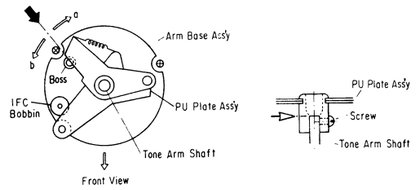
1) Before motor starts rotating, a magnet pole on rotor is closely locating to one of position detecting coils, Ln1 ~ Ln3. This position detecting coil is saturated by the flux of the magnet, which causes the impedance decrease of the coil and high frequency signal (53 kHz) from O.S.C. flows through capacitor C11.
2) If a current flows one of position detecting coils (Ln1 ~ Ln3), a transistor among Q04, Q05, and Q06 corresponding with the Ln1 ~ Ln3 turns ON, therefore one of Q01, Q02, and Q03 also becomes on to start up the motor to flow a current into driving coil.
3) After start-up to rotate the motor, a current flows into the next position detecting coil and driving coil successively that motor starts normal rotation.



4. ADJUSTMENTS

[1] Adjustment of Auto Return

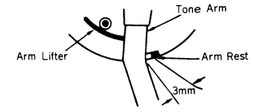
Adjust this line to the center of the Boss



Since the mounting angle of PU plate ass'y is critically relating to obtain the precise auto return operation, adjust the side line of PU plate ass'y to the center of the boss of arm base ass'y.
If the side line of PU plate ass'y locates toward a direction, there might be a possibility auto return operation is performed too early, or tonearm is bounded by arm rest.
If the side line of PU plate ass'y is placed toward b direction, there might be a possibility of too late auto return.
As to the height of PU plate ass'y to mount, make the end of arm shaft and the step inside of boss even.

Adjust screw S2 (under the rubber lid of arm base) by the following procedure. (See Top View). Adjust screw S2 to lift the tonearm when stylus reaches the middle way of lead out groove. By turning the screw counter clockwise, auto return operation starts earlyer and clockwise, later.

[2] Adjustment of Power Switch



This adjustment should be performed after auto return adjustment. Adjust screw S1 from hole for adjustment on the cabinet as following after removing plater. (See Top View).

1) When returning tonearm to arm rest, micro switch should be turned off 3 mm before arm rest. (See Fig. above).
2) When moving tonearm to the direction of platter micro switch should be turned on at the periphery of platter.
3) Confirm tonearm is not rebounded when returned.

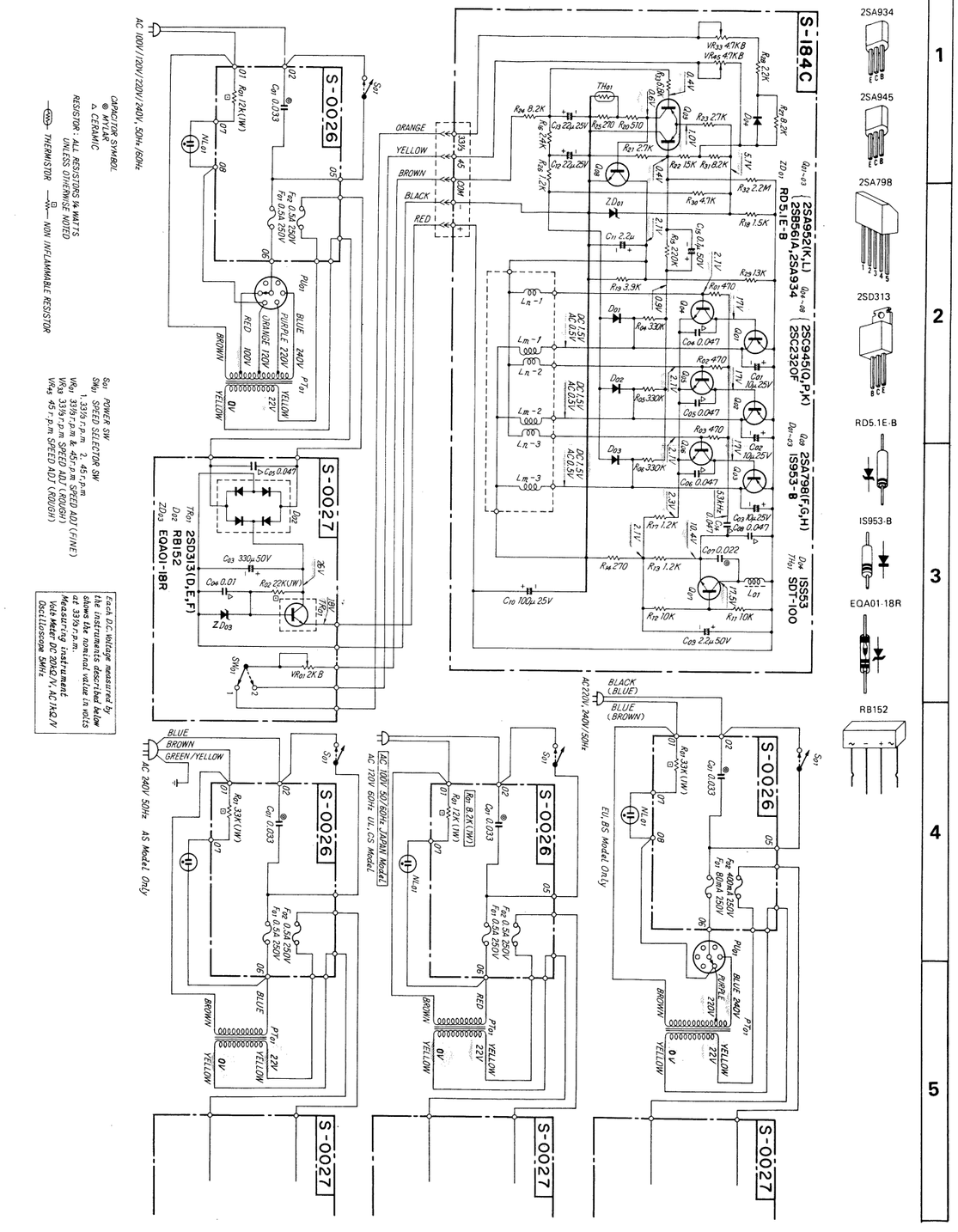
5. NOTE FOR MOUTING THE MOTOR Ass'y

In case of mounting motor ass'y on the mechanism chassis, there is a play between mounting boss and chassis. If main gear and that of platter is tightly engaged carelessly rumbling sound might be occurred. To prevent above, mounting of motor to separate main gear from that of platter is recommended. After replacement, confirm gearing between them.

Abbreviations

1. Pan Head Tapping Screw ..... PT Type
2. Washer Head Tapping Screw ..... WT Type
3. Pan Head Screw ..... P Type
4. Pan Head SEMS A Screw ... PSA Type
5. Pan Head SEMS B Screw ... PSB Type
6. Binding Head SEMS F Screw ..... BSF Type
7. Binding Head Screw ..... B Type
8. Flat Countersunk Head Screw ..... F Type
9. Flat Countersunk Wood Screw ..... FC Type
10. Round Head Wood Screw ..... RH Type
11. Hex. Socket Setscrew ..... SC Type
12. Slot Type Setscrew ..... SS Type
13. Spring Washer ..... S Type
14. Plain Washer ..... P Type
15. Retaining Ring (E Washer) ..... E Type

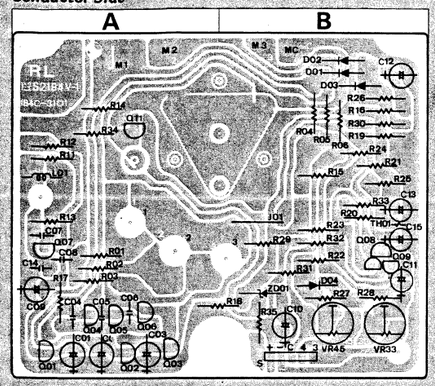
6. SCHEMATIC DIAGRAM



7. PARTS LIST OF CIRCUIT BOARD

7-1. 184C Motor Control Circuit Board

Conductor Side



Note: The circuit board 184C & S0027 are not supplied as the assembled, the individual parts on the circuit board, however, are provided for orders.

Parts List <184C>

Parts No.	Stock No.	Description	Position
●Transistor			
Q 01 ~ 03	0301221	2SA934 Q	A
Q 04 ~ 08	0305951 ~ 3	2SC945P (Q, K)	A, B
Q 09	0360290.1	2SA798F (G)	B
●Diode			
D 01 ~ 03	0311050	1S953	B
D 04	0311050	1S953	B
ZD01	0316630	RD51EB	B
●Thermistor			
TH01	0320140	SDT-100	B
VR33, 45	1035110	4.7kΩB Speed Select Volume	B

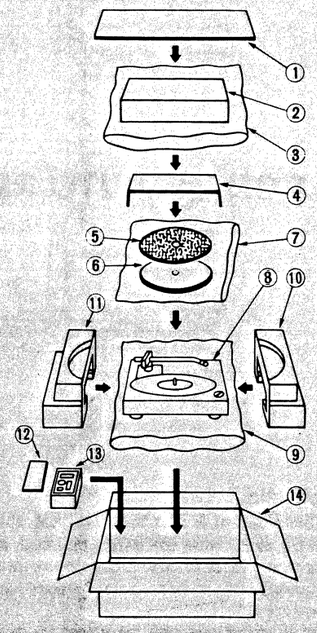
7-2. S0027 Pitch Control Circuit Board

Parts List <S0027>

Parts No.	Stock No.	Description
●Transistor		
TR01	0308391 ~ 3	2SD313 D, E, F
●Zener Diode		
ZD03	0316030	EQA01-19R
●Diode		
D 02	0311700	RB152
C 03	0505331	330μF 50V E.C.
VR01	1005400	2kΩB Pitch Control Volume
SW01	1131950	33/45 Speed Selector Switch
R 02	0211222	2.2kΩ 1W N.I.R.

8. PACKING LIST

Parts No.	Stock No.	Description
1	9012320	Protector Sheet, upper
2	7012221	Dust Cover Ass'y
3	9122111	Dust Cover Bag
4	9012370	Protector Sheet, turntable sheet
5	5502960	Turntable Sheet <XX, EU, CS, BS>
	5502970	Turntable Sheet <UL>
6	6112230	Turntable
7	9116600	Turntable Bag
8		Turntable Unit
9	9112270	Turntable Unit Bag
10	9022670	Styrofoam Packing, front
11	9022680	Styrofoam Packing, rear
12	9022660	Protector Sheet, accessory box
13	9022690	Accessory Box
14	9002840	Carton Case
	9002850	Carton Case (Silver MODEL only)



9. ACCESSORY PARTS LIST

	Stock No.	Description
	6912670	Main Weight Ass'y
	4310370	Cartridge Ass'y, SC-50
	6172040	EP Adaptor
	6922410	Auto Hinge
	9232290	Schematic Diagram
	9205190	Operating Instractions

Sansui

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